



3

SEQUENCE LISTING

<110> Barker, Christopher A.
Morsey, Mohamad

<120> IMMUNOLOGICAL METHODS TO MODULATE MYOSTATIN IN
VERTEBRATE SUBJECTS

<130> 9001-0042.01

<140> 10/074,152
<141> 2002-02-11

<150> 09/252,149
<151> 1999-02-18

<160> 39

<170> PatentIn Ver. 2.0

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tatcctcata cccatcttgt gcaccaagca aacccagag gttcagccgg cccctgctgt 1020
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1128

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20 25 30
Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Leu Trp Arg Glu Asn Thr
35 40 45
Thr Ser Ser Arg Leu Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60
Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Ala Ile Arg Gln Leu
65 70 75 80
Leu Pro Lys Ala Pro Pro Leu Leu Glu Leu Ile Asp Gln Phe Asp Val
85 90 95
Gln Arg Asp Ala Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr His
100 105 110
Ala Arg Thr Glu Thr Val Ile Thr Met Pro Thr Glu Ser Asp Leu Leu
115 120 125
Thr Gln Val Glu Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
130 135 140
Lys Ile Gln Tyr Asn Lys Leu Val Lys Ala Gln Leu Trp Ile Tyr Leu
145 150 155 160
Arg Pro Val Lys Thr Pro Ala Thr Val Phe Val Gln Ile Leu Arg Leu
165 170 175
Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
180 185 190
Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
195 200 205
Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
210 215 220
Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val Thr
225 230 235 240
Phe Pro Glu Pro Gly Glu Asp Gly Leu Thr Pro Phe Leu Glu Val Lys
245 250 255
Val Thr Asp Thr Pro Lys Arg Ser Arg Asp Phe Gly Leu Asp Cys
260 265 270
Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val

275

280

285

Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
290 295 300

Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
305 310 315 320

Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
325 330 335

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
340 345 350

Phe Asn Gly Glu Gly Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
355 360 365

Val Asp Arg Cys Gly Cys Ser
370 375

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<212> DNA

<213> Artificial Sequence

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<222> (1)...(60)

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<223> Description of Artificial Sequence: MYOS 1 peptide coding sequence,
Figure 2

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gga tcc cgt tct cgt cgc gac ttt ggt ctg gac tgc gac gaa cat tct 48
Gly Ser Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys Asp Glu His Ser
1 5 10 15

acc gaa aga tct 60
Thr Glu Arg Ser
20

<210> 4

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 1 peptide coding sequence,
Figure 2

<400> 4

Gly Ser Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys Asp Glu His Ser
1 5 10 15

Thr Glu Arg Ser
20

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<210> 5
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 3 peptide coding sequence,
Figure 3

<220>
<221> CDS
<222> (1)..(51)

<400> 5
gga tcc tct cgt tgc tgt cgc tat ccg ctg acc gtt gac ttc gaa aga 48
Gly Ser Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val Asp Phe Glu Arg
1 5 10 15

tct 51
Ser

<210> 6
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 3 peptide coding sequence,
Figure 3

<400> 6
Gly Ser Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val Asp Phe Glu Arg
1 5 10 15

Ser

<210> 7
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 5 peptide coding sequence,
Figure 4

<220>
<221> CDS
<222> (1)..(57)

<400> 7
gga tcc ttc gaa gct ttt ggt tgg gac tgg atc att gca ccg aaa cgt 48
Gly Ser Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg
1 5 10 15

tat aga tct 57
Tyr Arg Ser

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<210> 8
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 5 peptide coding sequence,
Figure 4

<400> 8
Gly Ser Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg
1 5 10 15

Tyr Arg Ser

<210> 9
<211> 54
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 7 peptide coding sequence,
Figure 5

<220>
<221> CDS
<222> (1)...(54)

<400> 9
gga tcc aaa cgt tat aaa gct aac tat tgc tct ggt gaa tgc gaa ttc 48
Gly Ser Lys Arg Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe
1 5 10 15

aga tct 54
Arg Ser

<210> 10
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 7 peptide coding sequence,
Figure 5

<400> 10
Gly Ser Lys Arg Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe
1 5 10 15

Arg Ser

<210> 11
<211> 72
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 9 peptide coding sequence,
Figure 6

<220>
<221> CDS
<222> (1)..(72)

<400> 11
gga tcc gaa ttc gtt ttc ctg cag aaa tat ccg cat acc cat ctg gtt 48
Gly Ser Glu Phe Val Phe Leu Gln Lys Tyr Pro His Thr His Leu Val
1 5 10 15

cat cag gct aac ccg cgt aga tct 72
His Gln Ala Asn Pro Arg Arg Ser
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<210> 12
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 9 peptide coding sequence,
Figure 6

<400> 12
Gly Ser Glu Phe Val Phe Leu Gln Lys Tyr Pro His Thr His Leu Val
1 5 10 15

His Gln Ala Asn Pro Arg Arg Ser
20

<210> 13
<211> 81
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 11 peptide coding sequence,
Figure 7

<220>
<221> CDS
<222> (1)..(81)

<400> 13
gga tcc gct ggt ccg tgc tgt tat ccg acc aaa atg tct ccg atc aac 48
Gly Ser Ala Gly Pro Cys Cys Tyr Pro Thr Lys Met Ser Pro Ile Asn
1 5 10 15

atg ctg tat ttc aac ggt gaa tgc cag aga tct 81
Met Leu Tyr Phe Asn Gly Glu Cys Gln Arg Ser
20 25

<210> 14
<211> 27
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 11 peptide coding sequence,
Figure 7

<400> 14

Gly Ser Ala Gly Pro Cys Cys Tyr Pro Thr Lys Met Ser Pro Ile Asn
1 5 10 15

Met Leu Tyr Phe Asn Gly Glu Cys Gln Arg Ser
20 25

<210> 15

<211> 72

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 13 peptide coding sequence,
Figure 8

<220>

<221> CDS

<222> (1)..(72)

<400> 15

gga tcc gaa tgc cag atc att tat tgc aaa atc ccg gct atg gtt gta 48
Gly Ser Glu Cys Gln Ile Ile Tyr Cys Lys Ile Pro Ala Met Val Val
1 5 10 15

gac cgt tgc ggt tgt tct aga tct 72
Asp Arg Cys Gly Cys Ser Arg Ser
20

<210> 16

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 13 peptide coding sequence,
Figure 8

<400> 16

Gly Ser Glu Cys Gln Ile Ile Tyr Cys Lys Ile Pro Ala Met Val Val
1 5 10 15

Asp Arg Cys Gly Cys Ser Arg Ser
20

<210> 17

<211> 63

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 15 peptide coding sequence,

Figure 9

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<220>
<221> CDS
<222> (1)..(63)

<400> 17
gga tcc gaa cag aaa gaa aac gtt gaa aaa gaa ggt ctg tgc aac gct    48
Gly Ser Glu Gln Lys Glu Asn Val Glu Lys Glu Gly Leu Cys Asn Ala
 1           5           10           15

tgc ctg tgg aga tct
Cys Leu Trp Arg Ser
 20

<210> 18
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 15 peptide coding sequence,
Figure 9

<400> 18
Gly Ser Glu Gln Lys Glu Asn Val Glu Lys Glu Gly Leu Cys Asn Ala
 1           5           10           15

Cys Leu Trp Arg Ser
 20

<210> 19
<211> 60
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: MYOS 17 peptide coding sequence,
Figure 10

<220>
<221> CDS
<222> (1)..(60)

<400> 19
gga tcc cat gac ctg gct gtt acc ttc ccg gaa ccg ggt gaa gac ggt    48
Gly Ser His Asp Leu Ala Val Thr Phe Pro Glu Pro Gly Glu Asp Gly
 1           5           10           15

ctg acc aga tct
Leu Thr Arg Ser
 20

<210> 20
<211> 20
<212> PRT
<213> Artificial Sequence
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<220>

<223> Description of Artificial Sequence: MYOS 17 peptide coding sequence,
Figure 10

<400> 20

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ser | His | Asp | Leu | Ala | Val | Thr | Phe | Pro | Glu | Pro | Gly | Glu | Asp | Gly |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | |
| Leu | Thr | Arg | Ser | | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | |

<210> 21

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 19 peptide coding sequence,
Figure 11

<220>

<221> CDS

<222> (1)...(60)

<400> 21

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| gga | tcc | acc | ccg | ttc | ctg | gaa | gtt | aaa | gtt | acc | gac | act | ccg | aaa | cgt | 48 |
| Gly | Ser | Thr | Pro | Phe | Leu | Glu | Val | Lys | Val | Thr | Asp | Thr | Pro | Lys | Arg | |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | | |

tct cgt aga tct

60

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Ser | Arg | Arg | Ser | | | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | | |

<210> 22

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: MYOS 19 peptide coding sequence,
Figure 11

<400> 22

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Gly | Ser | Thr | Pro | Phe | Leu | Glu | Val | Lys | Val | Thr | Asp | Thr | Pro | Lys | Arg | 48 |
| 1 | | | | 5 | | | | | 10 | | | | 15 | | | |

| | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Ser | Arg | Arg | Ser | | | | | | | | | | | | | |
| | | | 20 | | | | | | | | | | | | | |

<210> 23

<211> 372

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: reconstructed
myostatin active region, Figure 13

<220>
<221> CDS
<222> (1)...(372)

<400> 23
gga tcc cgt tct cgt cgc gac ttt ggt ctg gac tgc gac gaa cat tct 48
Gly Ser Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys Asp Glu His Ser
1 5 10 15

acc gaa aga tcc tct cgt tgc tgt cgc tat ccg ctg acc gtt gac ttc 96
Thr Glu Arg Ser Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val Asp Phe
20 25 30

gaa gct ttt ggt tgg gac tgg atc att gca ccg aaa cgt tat aga tcc 144
Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr Arg Ser
35 40 45

aaa cgt tat aaa gct aac tat tgc tct ggt gaa tgc gaa ttc gtt ttc 192
Lys Arg Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe
50 55 60

ctg cag aaa tat ccg cat acc cat ctg gtt cat cag gct aac ccg cgt 240
Leu Gln Lys Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg
65 70 75 80

aga tcc gct ggt ccg tgc tgt tat ccg acc aaa atg tct ccg atc aac 288
Arg Ser Ala Gly Pro Cys Cys Tyr Pro Thr Lys Met Ser Pro Ile Asn
85 90 95

atg ctg tat ttc aac ggt gaa tgc cag atc att tat tgc aaa atc ccg 336
Met Leu Tyr Phe Asn Gly Glu Cys Gln Ile Ile Tyr Cys Lys Ile Pro
100 105 110

gct atg gtt gta gac cgt tgc ggt tgt tct aga tct 372
Ala Met Val Val Asp Arg Cys Gly Cys Ser Arg Ser
115 120

<210> 24
<211> 124
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: reconstructed
myostatin active region, Figure 13

<400> 24
Gly Ser Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys Asp Glu His Ser
1 5 10 15

Thr Glu Arg Ser Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val Asp Phe
20 25 30

Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr Arg Ser
35 40 45

Lys Arg Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe
50 55 60

Leu Gln Lys Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg

| | | | |
|----------------------------------------------------------------------------------------------|-----|-----|-----|
| 65 | 70 | 75 | 80 |
| Arg Ser Ala Gly Pro Cys Cys Tyr Pro Thr Lys Met Ser Pro Ile Asn | | | |
| 85 | | 90 | 95 |
| Met Leu Tyr Phe Asn Gly Glu Cys Gln Ile Ile Tyr Cys Lys Ile Pro | | | |
| 100 | | 105 | 110 |
| Ala Met Val Val Asp Arg Cys Gly Cys Ser Arg Ser | | | |
| 115 | | 120 | |
| <210> 25 | | | |
| <211> 1473 | | | |
| <212> DNA | | | |
| <213> Artificial Sequence | | | |
| <220> | | | |
| <223> Description of Artificial Sequence: leukotoxin polypeptide carrier, Figures 15A-15D | | | |
| <220> | | | |
| <221> CDS | | | |
| <222> (1)..(1473) | | | |
| <400> 25 | | | |
| atg gct act gtt ata gat cta agc ttc cca aaa act ggg gca aaa aaa | | | 48 |
| Met Ala Thr Val Ile Asp Leu Ser Phe Pro Lys Thr Gly Ala Lys Lys | | | |
| 1 | 5 | 10 | 15 |
| att atc ctc tat att ccc caa aat tac caa tat gat act gaa caa ggt | | | 96 |
| Ile Ile Leu Tyr Ile Pro Gln Asn Tyr Gln Tyr Asp Thr Glu Gln Gly | | | |
| 20 | 25 | 30 | |
| aat ggt tta cag gat tta gtc aaa gcg gcc gaa gag ttg ggg att gag | | | 144 |
| Asn Gly Leu Gln Asp Leu Val Lys Ala Ala Glu Glu Leu Gly Ile Glu | | | |
| 35 | 40 | 45 | |
| gta caa aga gaa gaa cgc aat aat att gca aca gct caa acc acc agt tta | | | 192 |
| Val Gln Arg Glu Glu Arg Asn Asn Ile Ala Thr Ala Gln Thr Ser Leu | | | |
| 50 | 55 | 60 | |
| ggc acg att caa acc gct att ggc tta act gag cgt ggc att gtg tta | | | 240 |
| Gly Thr Ile Gln Thr Ala Ile Gly Leu Thr Glu Arg Gly Ile Val Leu | | | |
| 65 | 70 | 75 | 80 |
| tcc gct cca caa att gat aaa ttg cta cag aaa act aaa gca ggc caa | | | 288 |
| Ser Ala Pro Gln Ile Asp Lys Leu Leu Gln Lys Thr Lys Ala Gly Gln | | | |
| 85 | 90 | 95 | |
| gca tta ggt tct gcc gaa agc att gta caa aat gca aat aaa gcc aaa | | | 336 |
| Ala Leu Gly Ser Ala Glu Ser Ile Val Gln Asn Ala Asn Lys Ala Lys | | | |
| 100 | 105 | 110 | |
| act gta tta tct ggc att caa tct att tta ggc tca gta ttg gct gga | | | 384 |
| Thr Val Leu Ser Gly Ile Gln Ser Ile Leu Gly Ser Val Leu Ala Gly | | | |
| 115 | 120 | 125 | |
| atg gat tta gat gag gcc tta cag aat aac agc aac caa cat gct ctt | | | 432 |
| Met Asp Leu Asp Glu Ala Leu Gln Asn Asn Ser Asn Gln His Ala Leu | | | |
| 130 | 135 | 140 | |

| | | |
|---------------------------------------------------------------------|-----|------|
| gct aaa gct ggc ttg gag cta aca aat tca tta att gaa aat att att gct | | 480 |
| Ala Lys Ala Gly Leu Glu Leu Thr Asn Ser Leu Ile Glu Asn Ile Ala | | |
| 145 | 150 | 155 |
| 160 | | |
| aat tca gta aaa aca ctt gac gaa ttt ggt gag caa att agt caa ttt | | 528 |
| Asn Ser Val Lys Thr Leu Asp Glu Phe Gly Glu Gln Ile Ser Gln Phe | | |
| 165 | 170 | 175 |
| ggt tca aaa cta caa aat atc aaa ggc tta ggg act tta gga gac aaa | | 576 |
| Gly Ser Lys Leu Gln Asn Ile Lys Gly Leu Gly Thr Leu Gly Asp Lys | | |
| 180 | 185 | 190 |
| ctc aaa aat atc ggt gga ctt gat aaa gct ggc ctt ggt tta gat gtt | | 624 |
| Leu Lys Asn Ile Gly Gly Leu Asp Lys Ala Gly Leu Gly Leu Asp Val | | |
| 195 | 200 | 205 |
| atc tca ggg cta tta tcg ggc gca acc gct gca ctt gta ctt gca gat | | 672 |
| Ile Ser Gly Leu Leu Ser Gly Ala Thr Ala Ala Leu Val Leu Ala Asp | | |
| 210 | 215 | 220 |
| aaa aat gct tca aca gct aaa aaa gtg ggt gcg ggt ttt gaa ttg gca | | 720 |
| Lys Asn Ala Ser Thr Ala Lys Lys Val Gly Ala Gly Phe Glu Leu Ala | | |
| 225 | 230 | 235 |
| 240 | | |
| aaccaa gtt gtt ggt aat att acc aaa gcc gtt tct tct tac att tta | | 768 |
| Asn Gln Val Val Gly Asn Ile Thr Lys Ala Val Ser Ser Tyr Ile Leu | | |
| 245 | 250 | 255 |
| gcc caa cgt gtt gca gca ggt tta tct tca act ggg cct gtg gct gct | | 816 |
| Ala Gln Arg Val Ala Ala Gly Leu Ser Ser Thr Gly Pro Val Ala Ala | | |
| 260 | 265 | 270 |
| tta att gct tct act gtt tct ctt gcg att agc cca tta gca ttt gcc | | 864 |
| Leu Ile Ala Ser Thr Val Ser Leu Ala Ile Ser Pro Leu Ala Phe Ala | | |
| 275 | 280 | 285 |
| ggt att gcc gat aaa ttt aat cat gca aaa agt tta gag agt tat gcc | | 912 |
| Gly Ile Ala Asp Lys Phe Asn His Ala Lys Ser Leu Glu Ser Tyr Ala | | |
| 290 | 295 | 300 |
| gaa cgc ttt aaa aaa tta ggc tat gac gga gat aat tta tta gca gaa | | 960 |
| Glu Arg Phe Lys Lys Leu Gly Tyr Asp Gly Asp Asn Leu Leu Ala Glu | | |
| 305 | 310 | 315 |
| 320 | | |
| tat cag cgg gga aca ggg act att gat gca tcg gtt act gca att aat | | 1008 |
| Tyr Gln Arg Gly Thr Gly Thr Ile Asp Ala Ser Val Thr Ala Ile Asn | | |
| 325 | 330 | 335 |
| acc gca ttg gcc gct att gct ggt ggt gtg tct gct gct gca gcc gat | | 1056 |
| Thr Ala Leu Ala Ala Ile Ala Gly Gly Val Ser Ala Ala Ala Asp | | |
| 340 | 345 | 350 |
| tta aca ttt gaa aaa gtt aaa cat aat ctt gtc atc acg aat agc aaa | | 1104 |
| Leu Thr Phe Glu Lys Val Lys His Asn Leu Val Ile Thr Asn Ser Lys | | |
| 355 | 360 | 365 |
| aaa gag aaa gtg acc att caa aac tgg ttc cga gag gct gat ttt gct | | 1152 |
| Lys Glu Lys Val Thr Ile Gln Asn Trp Phe Arg Glu Ala Asp Phe Ala | | |
| 370 | 375 | 380 |
| aaa gaa gtg cct aat tat aaa gca act aaa gat gag aaa atc gaa gaa | | 1200 |

| | | | |
|-----------------------------------------------------------------|-----|-----|------|
| Lys Glu Val Pro Asn Tyr Lys Ala Thr Lys Asp Glu Lys Ile Glu Glu | | | |
| 385 | 390 | 395 | 400 |
| atc atc ggt caa aat ggc gag cgg atc acc tca aag caa gtt gat gat | | | 1248 |
| Ile Ile Gly Gln Asn Gly Glu Arg Ile Thr Ser Lys Gln Val Asp Asp | | | |
| 405 | 410 | 415 | |
| ctt atc gca aaa ggt aac ggc aaa att acc caa gat gag cta tca aaa | | | 1296 |
| Leu Ile Ala Lys Gly Asn Gly Lys Ile Thr Gln Asp Glu Leu Ser Lys | | | |
| 420 | 425 | 430 | |

| | | | |
|-----------------------------------------------------------------|-----|-----|------|
| gtt gtt gat aac tat gaa ttg ctc aaa cat agc aaa aat gtg aca aac | | | 1344 |
| Val Val Asp Asn Tyr Glu Leu Leu Lys His Ser Lys Asn Val Thr Asn | | | |
| 435 | 440 | 445 | |
| agc tta gat aag tta atc tca tct gta agt gca ttt acc tcg tct aat | | | 1392 |
| Ser Leu Asp Lys Leu Ile Ser Ser Val Ser Ala Phe Thr Ser Ser Asn | | | |
| 450 | 455 | 460 | |
| gat tcg aga aat gta tta gtg gct cca act tca atg ttg gat caa agt | | | 1440 |
| Asp Ser Arg Asn Val Leu Val Ala Pro Thr Ser Met Leu Asp Gln Ser | | | |
| 465 | 470 | 475 | 480 |
| tta tct tct ctt caa ttt gct agg gga tcc tag | | | 1473 |
| Leu Ser Ser Leu Gln Phe Ala Arg Gly Ser | | | |
| 485 | 490 | | |

<210> 26
<211> 490
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: leukotoxin polypeptide carrier,
Figures 15A-15D

<400> 26
Met Ala Thr Val Ile Asp Leu Ser Phe Pro Lys Thr Gly Ala Lys Lys
1 5 10 15

Ile Ile Leu Tyr Ile Pro Gln Asn Tyr Gln Tyr Asp Thr Glu Gln Gly
20 25 30

Asn Gly Leu Gln Asp Leu Val Lys Ala Ala Glu Glu Leu Gly Ile Glu
35 40 45

Val Gln Arg Glu Glu Arg Asn Asn Ile Ala Thr Ala Gln Thr Ser Leu
50 55 60

Gly Thr Ile Gln Thr Ala Ile Gly Leu Thr Glu Arg Gly Ile Val Leu
65 70 75 80

Ser Ala Pro Gln Ile Asp Lys Leu Leu Gln Lys Thr Lys Ala Gly Gln
85 90 95

Ala Leu Gly Ser Ala Glu Ser Ile Val Gln Asn Ala Asn Lys Ala Lys
100 105 110

Thr Val Leu Ser Gly Ile Gln Ser Ile Leu Gly Ser Val Leu Ala Gly
 115 120 125
 Met Asp Leu Asp Glu Ala Leu Gln Asn Asn Ser Asn Gln His Ala Leu
 130 135 140
 Ala Lys Ala Gly Leu Glu Leu Thr Asn Ser Leu Ile Glu Asn Ile Ala
 145 150 155 160
 Asn Ser Val Lys Thr Leu Asp Glu Phe Gly Glu Gln Ile Ser Gln Phe
 165 170 175
 Gly Ser Lys Leu Gln Asn Ile Lys Gly Leu Gly Thr Leu Gly Asp Lys
 180 185 190
 Leu Lys Asn Ile Gly Gly Leu Asp Lys Ala Gly Leu Gly Leu Asp Val
 195 200 205
 Ile Ser Gly Leu Leu Ser Gly Ala Thr Ala Ala Leu Val Leu Ala Asp
 210 215 220
 Lys Asn Ala Ser Thr Ala Lys Lys Val Gly Ala Gly Phe Glu Leu Ala
 225 230 235 240
 Asn Gln Val Val Gly Asn Ile Thr Lys Ala Val Ser Ser Tyr Ile Leu
 245 250 255
 Ala Gln Arg Val Ala Ala Gly Leu Ser Ser Thr Gly Pro Val Ala Ala
 260 265 270
 Leu Ile Ala Ser Thr Val Ser Leu Ala Ile Ser Pro Leu Ala Phe Ala
 275 280 285
 Gly Ile Ala Asp Lys Phe Asn His Ala Lys Ser Leu Glu Ser Tyr Ala
 290 295 300
 Glu Arg Phe Lys Lys Leu Gly Tyr Asp Gly Asp Asn Leu Leu Ala Glu
 305 310 315 320
 Tyr Gln Arg Gly Thr Gly Thr Ile Asp Ala Ser Val Thr Ala Ile Asn
 325 330 335
 Thr Ala Leu Ala Ala Ile Ala Gly Gly Val Ser Ala Ala Ala Asp
 340 345 350
 Leu Thr Phe Glu Lys Val Lys His Asn Leu Val Ile Thr Asn Ser Lys
 355 360 365
 Lys Glu Lys Val Thr Ile Gln Asn Trp Phe Arg Glu Ala Asp Phe Ala
 370 375 380
 Lys Glu Val Pro Asn Tyr Lys Ala Thr Lys Asp Glu Lys Ile Glu Glu
 385 390 395 400
 Ile Ile Gly Gln Asn Gly Glu Arg Ile Thr Ser Lys Gln Val Asp Asp
 405 410 415
 Leu Ile Ala Lys Gly Asn Gly Lys Ile Thr Gln Asp Glu Leu Ser Lys
 420 425 430
 Val Val Asp Asn Tyr Glu Leu Leu Lys His Ser Lys Asn Val Thr Asn

435

440

445

Ser Leu Asp Lys Leu Ile Ser Ser Val Ser Ala Phe Thr Ser Ser Asn
 450 455 460

Asp Ser Arg Asn Val Leu Val Ala Pro Thr Ser Met Leu Asp Gln Ser
 465 470 475 480

Leu Ser Ser Leu Gln Phe Ala Arg Gly Ser
 485 490

<210> 27
 <211> 376
 <212> PRT
 <213> Mus musculus

<400> 27
 Met Met Gln Lys Leu Gln Met Tyr Val Tyr Ile Tyr Leu Phe Met Leu
 1 5 10 15

Ile Ala Ala Gly Pro Val Asp Leu Asn Glu Gly Ser Glu Arg Glu Glu
 20 25 30

Asn Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Ala Trp Arg Gln Asn
 35 40 45

Thr Arg Tyr Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys
 50 55 60

Leu Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Ala Ile Arg Gln
 65 70 75 80

Leu Leu Pro Arg Ala Pro Pro Leu Arg Glu Leu Ile Asp Gln Tyr Asp
 85 90 95

Val Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr
 100 105 110

His Ala Thr Thr Glu Thr Ile Ile Thr Met Pro Thr Glu Ser Asp Phe
 115 120 125

Leu Met Gln Ala Asp Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser
 130 135 140

Ser Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr
 145 150 155 160

Leu Arg Pro Val Lys Thr Pro Thr Thr Val Phe Val Gln Ile Leu Arg
 165 170 175

Leu Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser
 180 185 190

Leu Lys Leu Asp Met Ser Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp
 195 200 205

Val Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu
 210 215 220

Gly Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val
 225 230 235 240

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Phe | Pro | Gly | Pro | Gly | Glu | Asp | Gly | Leu | Asn | Pro | Phe | Leu | Glu | Val |
| 245 | | | | | | | | | | | | | | | 255 |
| Lys | Val | Thr | Asp | Thr | Pro | Lys | Arg | Ser | Arg | Arg | Asp | Phe | Gly | Leu | Asp |
| 260 | | | | | | | | | | | | | | | 270 |
| Cys | Asp | Glu | His | Ser | Thr | Glu | Ser | Arg | Cys | Cys | Arg | Tyr | Pro | Leu | Thr |
| 275 | | | | | | | | | | | | | | | 285 |
| Val | Asp | Phe | Glu | Ala | Phe | Gly | Trp | Asp | Trp | Ile | Ile | Ala | Pro | Lys | Arg |
| 290 | | | | | | | | | | | | | | | 300 |
| Tyr | Lys | Ala | Asn | Tyr | Cys | Ser | Gly | Glu | Cys | Glu | Phe | Val | Phe | Leu | Gln |
| 305 | | | | | | | | | | | | | | | 320 |
| Lys | Tyr | Pro | His | Thr | His | Leu | Val | His | Gln | Ala | Asn | Pro | Arg | Gly | Ser |
| 325 | | | | | | | | | | | | | | | 335 |
| Ala | Gly | Pro | Cys | Cys | Thr | Pro | Thr | Lys | Met | Ser | Pro | Ile | Asn | Met | Leu |
| 340 | | | | | | | | | | | | | | | 350 |
| Tyr | Phe | Asn | Gly | Lys | Glu | Gln | Ile | Ile | Tyr | Gly | Lys | Ile | Pro | Ala | Met |
| 355 | | | | | | | | | | | | | | | 365 |
| Val | Val | Asp | Arg | Cys | Gly | Cys | Ser | | | | | | | | |
| 370 | | | | | | | | | | | | | | | 375 |

<210> 28
<211> 376
<212> PRT
<213> Rattus norvegicus

| | | | | | | | | | | | | | | | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <400> 28 | | | | | | | | | | | | | | | |
| Met | Ile | Gln | Lys | Pro | Gln | Met | Tyr | Val | Tyr | Ile | Tyr | Leu | Phe | Val | Leu |
| 1 | | | | | | | | | | | | | | | 15 |
| Ile | Ala | Ala | Gly | Pro | Val | Asp | Leu | Asn | Glu | Asp | Ser | Glu | Arg | Glu | Ala |
| 20 | | | | | | | | | | | | | | | 30 |
| Asn | Val | Glu | Lys | Glu | Gly | Leu | Cys | Asn | Ala | Cys | Ala | Trp | Arg | Gln | Asn |
| 35 | | | | | | | | | | | | | | | 45 |
| Thr | Arg | Tyr | Ser | Arg | Ile | Glu | Ala | Ile | Lys | Ile | Gln | Ile | Leu | Ser | Lys |
| 50 | | | | | | | | | | | | | | | 60 |
| Leu | Arg | Leu | Glu | Thr | Ala | Pro | Asn | Ile | Ser | Lys | Asp | Ala | Ile | Arg | Gln |
| 65 | | | | | | | | | | | | | | | 80 |
| Leu | Leu | Pro | Arg | Ala | Pro | Pro | Leu | Arg | Glu | Leu | Ile | Asp | Gln | Tyr | Asp |
| 85 | | | | | | | | | | | | | | | 95 |
| Val | Gln | Arg | Asp | Asp | Ser | Ser | Asp | Gly | Ser | Leu | Glu | Asp | Asp | Tyr | |
| 100 | | | | | | | | | | | | | | | 110 |
| His | Ala | Thr | Thr | Glu | Thr | Ile | Ile | Thr | Met | Pro | Thr | Glu | Ser | Asp | Phe |
| 115 | | | | | | | | | | | | | | | 125 |
| Leu | Met | Gln | Ala | Asp | Gly | Lys | Pro | Lys | Cys | Cys | Phe | Phe | Lys | Phe | Ser |
| 130 | | | | | | | | | | | | | | | 140 |

Ser Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr
145 150 155 160

Leu Arg Ala Val Lys Thr Pro Thr Thr Val Phe Val Gln Ile Leu Arg
165 170 175

Leu Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser
180 185 190

Leu Lys Leu Asp Met Ser Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp
195 200 205

Val Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu
210 215 220

Gly Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val
225 230 235 240

Thr Phe Pro Gly Pro Gly Glu Asp Gly Leu Asn Pro Phe Leu Glu Val
245 250 255

Lys Val Thr Asp Thr Pro Lys Arg Ser Arg Arg Asp Phe Gly Leu Asp
260 265 270

Cys Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr
275 280 285

Val Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg
290 295 300

Tyr Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln
305 310 315 320

Lys Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser
325 330 335

Ala Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu
340 345 350

Tyr Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met
355 360 365

Val Val Asp Arg Cys Gly Cys Ser
370 375

<210> 29
<211> 375
<212> PRT
<213> Homo sapiens

<400> 29
Met Gln Lys Leu Gln Leu Cys Val Tyr Ile Tyr Leu Phe Met Leu Ile
1 5 10 15

Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu Asn
20 25 30

Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Thr Trp Arg Gln Asn Thr
35 40 45

Lys Ser Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60

Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Val Ile Arg Gln Leu
65 70 75 80

Leu Pro Lys Ala Pro Pro Leu Arg Glu Leu Ile Asp Gln Tyr Asp Val
85 90 95

Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr His
100 105 110

Ala Thr Thr Glu Thr Ile Ile Thr Met Pro Thr Glu Ser Asp Phe Leu
115 120 125

Met Gln Val Asp Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
130 135 140

Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr Leu
145 150 155 160

Arg Pro Val Glu Thr Pro Thr Thr Val Phe Val Gln Ile Leu Arg Leu
165 170 175

Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
180 185 190

Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
195 200 205

Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
210 215 220

Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val Thr
225 230 235 240

Phe Pro Gly Pro Gly Glu Asp Gly Leu Asn Pro Phe Leu Glu Val Lys
245 250 255

Val Thr Asp Thr Pro Lys Arg Ser Arg Asp Phe Gly Leu Asp Cys
260 265 270

Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val
275 280 285

Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
290 295 300

Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
305 310 315 320

Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
325 330 335

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
340 345 350

Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
355 360 365

Val Asp Arg Cys Gly Cys Ser
370 375

<210> 30
<211> 375
<212> PRT
<213> Papio hamadryas

<400> 30
Met Gln Lys Leu Gln Leu Cys Val Tyr Ile Tyr Leu Phe Met Leu Ile
1 5 10 15

Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu Asn
20 25 30

Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Thr Trp Arg Gln Asn Thr
35 40 45

Lys Ser Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60

Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Ala Ile Arg Gln Leu
65 70 75 80

Leu Pro Lys Ala Pro Pro Leu Arg Glu Leu Ile Asp Gln Tyr Asp Val
85 90 95

Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr His
100 105 110

Ala Thr Thr Glu Thr Ile Ile Thr Met Pro Thr Glu Ser Asp Phe Leu
115 120 125

Met Gln Val Asp Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
130 135 140

Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr Leu
145 150 155 160

Arg Pro Val Glu Thr Pro Thr Val Phe Val Gln Ile Leu Arg Leu
165 170 175

Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
180 185 190

Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
195 200 205

Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
210 215 220

Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val Thr
225 230 235 240

Phe Pro Gly Pro Gly Glu Asp Gly Leu Asn Pro Phe Leu Glu Val Lys
245 250 255

Val Thr Asp Thr Pro Lys Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys
260 265 270

Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val
275 280 285

Asp Phe Glu Ala Leu Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
290 295 300

Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
305 310 315 320

Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
325 330 335

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
340 345 350

Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
355 360 365

Val Asp Arg Cys Gly Cys Ser
370 375

<210> 31

<211> 375

<212> PRT

<213> bos taurus

<400> 31

Met Gln Lys Leu Gln Ile Ser Val Tyr Ile Tyr Leu Phe Met Leu Ile
1 5 10 15

Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu Asn
20 25 30

Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Leu Trp Arg Glu Asn Thr
35 40 45

Thr Ser Ser Arg Leu Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60

Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Ala Ile Arg Gln Leu
65 70 75 80

Leu Pro Arg Ala Pro Pro Leu Leu Glu Leu Ile Asp Gln Phe Asp Val
85 90 95

Gln Arg Asp Ala Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr His
100 105 110

Ala Arg Thr Glu Thr Val Ile Thr Met Pro Thr Glu Ser Asp Leu Leu
115 120 125

Thr Gln Val Glu Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
130 135 140

Lys Ile Gln Tyr Asn Lys Leu Val Lys Ala Gln Leu Trp Ile Tyr Leu
145 150 155 160

Arg Pro Val Lys Thr Pro Ala Thr Val Phe Val Gln Ile Leu Arg Leu
165 170 175

Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
 180 185 190
 Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
 195 200 205
 Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
 210 215 220
 Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val Thr
 225 230 235 240
 Phe Pro Glu Pro Gly Glu Asp Gly Leu Thr Pro Phe Leu Glu Val Lys
 245 250 255
 Val Thr Asp Thr Pro Lys Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys
 260 265 270

 Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val
 275 280 285
 Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
 290 295 300
 Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
 305 310 315 320
 Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
 325 330 335
 Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
 340 345 350
 Phe Asn Gly Glu Gly Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
 355 360 365
 Val Asp Arg Cys Gly Cys Ser
 370 375

 <210> 32
 <211> 375
 <212> PRT
 <213> Sus scrofa

 <400> 32
 Met Gln Lys Leu Gln Ile Tyr Val Tyr Ile Tyr Leu Phe Met Leu Ile
 1 5 10 15
 Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu Asn
 20 25 30
 Val Glu Lys Glu Gly Leu Cys Asn Ala Cys Met Trp Arg Gln Asn Thr
 35 40 45
 Lys Ser Ser Arg Leu Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
 50 55 60
 Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Ala Ile Arg Gln Leu
 65 70 75 80

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Pro | Arg | Ala | Pro | Pro | Leu | Arg | Glu | Leu | Ile | Asp | Gln | Tyr | Asp | Val |
| | | | | | | 85 | | | | | 90 | | | | 95 |
| Gln | Arg | Asp | Asp | Ser | Ser | Asp | Gly | Ser | Leu | Glu | Asp | Asp | Asp | Tyr | His |
| | | | | | | 100 | | | 105 | | | | | 110 | |
| Ala | Thr | Thr | Glu | Thr | Ile | Ile | Thr | Met | Pro | Thr | Glu | Ser | Asp | Leu | Leu |
| | | | | | | 115 | | 120 | | | | | 125 | | |
| Met | Gln | Val | Glu | Gly | Lys | Pro | Lys | Cys | Cys | Phe | Phe | Lys | Phe | Ser | Ser |
| | | | | | | 130 | | 135 | | | | 140 | | | |
| Lys | Ile | Gln | Tyr | Asn | Lys | Val | Val | Lys | Ala | Gln | Leu | Trp | Ile | Tyr | Leu |
| | | | | | | 145 | | 150 | | | 155 | | | | 160 |
| Arg | Pro | Val | Lys | Thr | Pro | Thr | Thr | Val | Phe | Val | Gln | Ile | Leu | Arg | Leu |
| | | | | | | 165 | | | 170 | | | | | 175 | |
| Ile | Lys | Pro | Met | Lys | Asp | Gly | Thr | Arg | Tyr | Thr | Gly | Ile | Arg | Ser | Leu |
| | | | | | | 180 | | | 185 | | | | 190 | | |
| Lys | Leu | Asp | Met | Asn | Pro | Gly | Thr | Gly | Ile | Trp | Gln | Ser | Ile | Asp | Val |
| | | | | | | 195 | | 200 | | | | 205 | | | |
| Lys | Thr | Val | Leu | Gln | Asn | Trp | Leu | Lys | Gln | Pro | Glu | Ser | Asn | Leu | Gly |
| | | | | | | 210 | | 215 | | | 220 | | | | |
| Ile | Glu | Ile | Lys | Ala | Leu | Asp | Glu | Asn | Gly | His | Asp | Leu | Ala | Val | Thr |
| | | | | | | 225 | | 230 | | | 235 | | | | 240 |
| Phe | Pro | Gly | Pro | Gly | Glu | Asp | Gly | Leu | Asn | Pro | Phe | Leu | Glu | Val | Lys |
| | | | | | | 245 | | | 250 | | | 255 | | | |
| Val | Thr | Asp | Thr | Pro | Lys | Arg | Ser | Arg | Arg | Asp | Phe | Gly | Leu | Asp | Cys |
| | | | | | | 260 | | | 265 | | | 270 | | | |
| Asp | Glu | His | Ser | Thr | Glu | Ser | Arg | Cys | Cys | Arg | Tyr | Pro | Leu | Thr | Val |
| | | | | | | 275 | | 280 | | | | 285 | | | |
| Asp | Phe | Glu | Ala | Phe | Gly | Trp | Asp | Trp | Ile | Ile | Ala | Pro | Lys | Arg | Tyr |
| | | | | | | 290 | | 295 | | | 300 | | | | |
| Lys | Ala | Asn | Tyr | Cys | Ser | Gly | Glu | Cys | Glu | Phe | Val | Phe | Leu | Gln | Lys |
| | | | | | | 305 | | 310 | | | 315 | | | | 320 |
| Tyr | Pro | His | Thr | His | Leu | Val | His | Gln | Ala | Asn | Pro | Arg | Gly | Ser | Ala |
| | | | | | | 325 | | | 330 | | | 335 | | | |
| Gly | Pro | Cys | Cys | Thr | Pro | Thr | Lys | Met | Ser | Pro | Ile | Asn | Met | Leu | Tyr |
| | | | | | | 340 | | | 345 | | | 350 | | | |
| Phe | Asn | Gly | Lys | Glu | Gln | Ile | Ile | Tyr | Gly | Lys | Ile | Pro | Ala | Met | Val |
| | | | | | | 355 | | | 360 | | | 365 | | | |
| Val | Asp | Arg | Cys | Gly | Cys | Ser | | | | | | | | | |
| | | | | | | 370 | | | 375 | | | | | | |

<210> 33
<211> 375

<212> PRT
<213> Ovis aries

<400> 33
Met Gln Lys Leu Gln Ile Phe Val Tyr Ile Tyr Leu Phe Met Leu Leu
1 5 10 15

Val Ala Gly Pro Val Asp Leu Asn Glu Asn Ser Glu Gln Lys Glu Asn
20 25 30

Val Glu Lys Lys Gly Leu Cys Asn Ala Cys Leu Trp Arg Gln Asn Asn
35 40 45

Lys Ser Ser Arg Leu Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60

Arg Leu Glu Thr Ala Pro Asn Ile Ser Lys Asp Ala Ile Arg Gln Leu
65 70 75 80

Leu Pro Arg Ala Pro Pro Leu Arg Glu Leu Ile Asp Gln Tyr Asp Val
85 90 95

Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr His
100 105 110

Val Thr Thr Glu Thr Val Ile Thr Met Pro Thr Glu Ser Asp Leu Leu
115 120 125

Ala Glu Val Gln Glu Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
130 135 140

Lys Ile Gln His Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr Leu
145 150 155 160

Arg Pro Val Lys Thr Pro Thr Thr Val Phe Val Gln Ile Leu Arg Leu
165 170 175

Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
180 185 190

Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
195 200 205

Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
210 215 220

Ile Glu Ile Lys Ala Leu Asp Glu Asn Gly His Asp Leu Ala Val Thr
225 230 235 240

Phe Pro Glu Pro Gly Glu Glu Gly Leu Asn Pro Phe Leu Glu Val Lys
245 250 255

Val Thr Asp Thr Pro Lys Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys
260 265 270

Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val
275 280 285

Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
290 295 300

Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Leu Phe Leu Gln Lys
305 310 315 320

Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Lys Gly Ser Ala
325 330 335

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
340 345 350

Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Gly Met Val
355 360 365

Val Asp Arg Cys Gly Cys Ser
370 375

<210> 34

<211> 375

<212> PRT

<213> Gallus gallus

<400> 34

Met Gln Lys Leu Ala Val Tyr Val Tyr Ile Tyr Leu Phe Met Gln Ile
1 5 10 15

Ala Val Asp Pro Val Ala Leu Asp Gly Ser Ser Gln Pro Thr Glu Asn
20 25 30

Ala Glu Lys Asp Gly Leu Cys Asn Ala Cys Thr Trp Arg Gln Asn Thr
35 40 45

Lys Ser Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60

Arg Leu Glu Gln Ala Pro Asn Ile Ser Arg Asp Val Ile Lys Gln Leu
65 70 75 80

Leu Pro Arg Ala Pro Pro Leu Gln Glu Leu Ile Asp Gln Tyr Asp Val
85 90 95

Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Asp Tyr His
100 105 110

Ala Thr Thr Glu Thr Ile Ile Thr Met Pro Thr Glu Ser Asp Phe Leu
115 120 125

Val Gln Met Glu Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
130 135 140

Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr Leu
145 150 155 160

Arg Gln Val Gln Lys Pro Thr Thr Val Phe Val Gln Ile Leu Arg Leu
165 170 175

Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
180 185 190

Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
195 200 205

Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
210 215 220

Ile Glu Ile Lys Ala Phe Asp Glu Thr Gly Arg Asp Leu Ala Val Thr
225 230 235 240

Phe Pro Gly Pro Gly Glu Asp Gly Leu Asn Pro Phe Leu Glu Val Arg
245 250 255

Val Thr Asp Thr Pro Lys Arg Ser Arg Arg Asp Phe Gly Leu Asp Cys
260 265 270

Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val
275 280 285

Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
290 295 300

Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
305 310 315 320

Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
325 330 335

Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
340 345 350

Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
355 360 365

Val Asp Arg Cys Gly Cys Ser
370 375

<210> 35

<211> 375

<212> PRT

<213> Meleagris gallopavo

<400> 35

Met Gln Ile Leu Ala Val Tyr Val Tyr Ile Tyr Leu Phe Met Gln Ile
1 5 10 15

Leu Val His Pro Val Ala Leu Asp Gly Ser Ser Gln Pro Thr Glu Asn
20 25 30

Ala Glu Lys Asp Gly Leu Cys Asn Ala Cys Thr Trp Arg Gln Asn Thr
35 40 45

Lys Ser Ser Arg Ile Glu Ala Ile Lys Ile Gln Ile Leu Ser Lys Leu
50 55 60

Arg Leu Glu Gln Ala Pro Asn Ile Ser Arg Asp Val Ile Lys Gln Leu
65 70 75 80

Leu Pro Arg Ala Pro Pro Leu Gln Glu Leu Ile Asp Gln Tyr Asp Val
85 90 95

Gln Arg Asp Asp Ser Ser Asp Gly Ser Leu Glu Asp Asp Tyr His
100 105 110

Ala Thr Thr Glu Thr Ile Ile Met Pro Thr Glu Ser Asp Phe Leu
 115 120 125
 Val Gln Met Glu Gly Lys Pro Lys Cys Cys Phe Phe Lys Phe Ser Ser
 130 135 140
 Lys Ile Gln Tyr Asn Lys Val Val Lys Ala Gln Leu Trp Ile Tyr Leu
 145 150 155 160
 Arg Gln Val Gln Lys Pro Thr Thr Val Phe Val Gln Ile Leu Arg Leu
 165 170 175
 Ile Lys Pro Met Lys Asp Gly Thr Arg Tyr Thr Gly Ile Arg Ser Leu
 180 185 190
 Lys Leu Asp Met Asn Pro Gly Thr Gly Ile Trp Gln Ser Ile Asp Val
 195 200 205
 Lys Thr Val Leu Gln Asn Trp Leu Lys Gln Pro Glu Ser Asn Leu Gly
 210 215 220
 Ile Glu Ile Lys Ala Phe Asp Glu Asn Gly Arg Asp Leu Ala Val Thr
 225 230 235 240
 Phe Pro Gly Pro Gly Glu Asp Gly Leu Asn Pro Phe Leu Glu Val Arg
 245 250 255
 Val Thr Asp Thr Pro Lys Arg Ser Arg Asp Phe Gly Leu Asp Cys
 260 265 270
 Asp Glu His Ser Thr Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val
 275 280 285
 Asp Phe Glu Ala Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr
 290 295 300
 Lys Ala Asn Tyr Cys Ser Gly Glu Cys Glu Phe Val Phe Leu Gln Lys
 305 310 315 320
 Tyr Pro His Thr His Leu Val His Gln Ala Asn Pro Arg Gly Ser Ala
 325 330 335
 Gly Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr
 340 345 350
 Phe Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ala Met Val
 355 360 365
 Val Asp Arg Cys Gly Cys Ser
 370 375

<210> 36
 <211> 374
 <212> PRT
 <213> Danio rerio

<400> 36
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 1 5 10 15

Gly Pro Val Gly Tyr Gly Asp Ile Thr Ala His Gln Gln Pro Ser Thr
 20 25 30

 Ala Thr Glu Glu Ser Glu Leu Cys Ser Thr Cys Glu Phe Arg Gln His
 35 40 45

 Ser Lys Leu Met Arg Leu His Ala Ile Lys Ser Gln Ile Leu Ser Lys
 50 55 60

 Leu Arg Leu Lys Gln Ala Pro Asn Ile Ser Arg Asp Val Val Lys Gln
 65 70 75 80

 Leu Leu Pro Arg Ala Pro Pro Leu Gln Gln Leu Leu Asp Gln Tyr Asp
 85 90 95

 Val Leu Gly Asp Asp Ser Lys Asp Gly Ala Val Glu Glu Asp Asp Glu
 100 105 110

 His Ala Thr Thr Glu Thr Ile Met Thr Met Ala Thr Glu Pro Asp Pro
 115 120 125

 Ile Val Gln Val Asp Arg Lys Pro Lys Cys Cys Phe Phe Ser Phe Ser
 130 135 140

 Pro Lys Ile Gln Ala Asn Arg Ile Val Arg Ala Gln Leu Trp Val His
 145 150 155 160

 Leu Arg Pro Ala Glu Glu Ala Thr Thr Val Phe Leu Gln Ile Ser Arg
 165 170 175

 Leu Met Pro Val Lys Asp Gly Gly Arg His Arg Ile Arg Ser Leu Lys
 180 185 190

 Ile Asp Val Asn Ala Gly Val Thr Ser Trp Gln Ser Ile Asp Val Lys
 195 200 205

 Gln Val Leu Thr Val Trp Leu Lys Gln Pro Glu Thr Asn Arg Gly Ile
 210 215 220

 Glu Ile Asn Ala Tyr Asp Ala Lys Gly Asn Asp Leu Ala Val Thr Ser
 225 230 235 240

 Thr Glu Thr Gly Glu Asp Gly Leu Leu Pro Phe Met Glu Val Lys Ile
 245 250 255

 Ser Glu Gly Pro Lys Arg Ile Arg Arg Asp Ser Gly Leu Asp Cys Asp
 260 265 270

 Glu Asn Ser Ser Glu Ser Arg Cys Cys Arg Tyr Pro Leu Thr Val Asp
 275 280 285

 Phe Glu Asp Phe Gly Trp Asp Trp Ile Ile Ala Pro Lys Arg Tyr Lys
 290 295 300

 Ala Asn Tyr Cys Ser Gly Glu Cys Asp Tyr Met Tyr Leu Gln Lys Tyr
 305 310 315 320

 Pro His Thr His Leu Val Asn Lys Ala Ser Pro Arg Gly Thr Ala Gly
 325 330 335

Pro Cys Cys Thr Pro Thr Lys Met Ser Pro Ile Asn Met Leu Tyr Phe
340 345 350

Asn Gly Lys Glu Gln Ile Ile Tyr Gly Lys Ile Pro Ser Met Val Val
355 360 365

Asp Arg Cys Gly Cys Ser
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<210> 37
<211> 6
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<220>
<223> Description of Artificial Sequence: myostatin peptide

<400> 37
Lys Arg Ser Arg Arg Asp
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<210> 38
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<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: myostatin peptide

<400> 38
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1 5

<210> 39
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
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<400> 39
Ser Leu Lys Asp Asp Asp
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